Coronary Heart Disease in Iowa

What is Coronary Heart Disease (CHD)?

Coronary Heart Disease (CHD) is a condition that reduces blood flow through the coronary arteries to the heart muscles.

Iowa Ranking Nationally in CHD Mortality Rate (2007)

Iowa ranks 38th out of the 50 states. Higher numbers represent higher death rates.

Significant Findings from Mortality Data

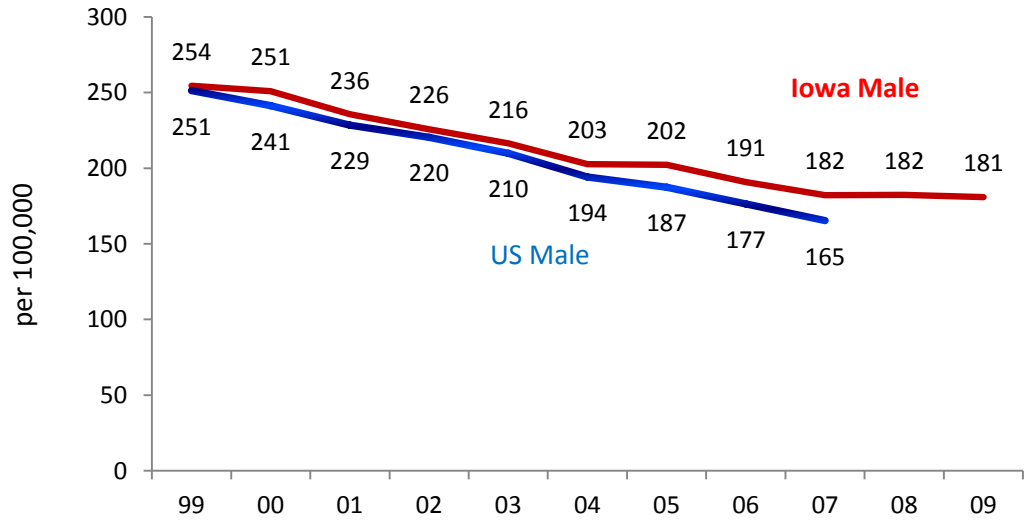
Trends in CHD deaths:

Despite the overall decrease in CHD deaths in Iowa, the death rates for males aged 35-44 and both males and females aged 45-54 showed an average 2% and 1% increase, respectively, during each of the past ten years (see Fig. 2).

Quick Facts

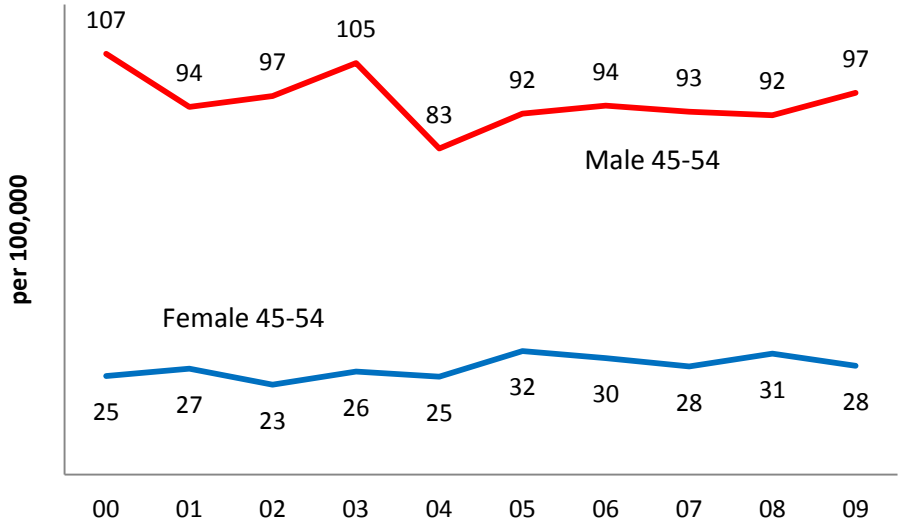
- 6,912 Iowans died of heart disease in 2009; the leading cause of death in Iowa since 1920. 75% of heart disease mortality, 5,161 deaths, was due to CHD. CHD is responsible for one of every five deaths in Iowa.
- CHD includes heart attack (acute myocardial infarction, 32%) and chest pain (angina pectoris). The male CHD death rate has always exceeded the female death rate. The male (181 deaths/100,000) to female (94/100,000) ratio was 1.9.
- Since 1999, Iowa's male CHD death rate was higher than the national male average (see Fig. 1). In 2007, Iowa's male CHD death rate was higher than the national average by 17 deaths/100,000 (182.1/100,000 vs. 165.4/100,000).
- Though CHD is an age-related disease, about 1,200 (42%) males vs. 400 (17%) females who died from CHD were younger than age 75.
- CHD is also a leading cause of premature, permanent disability in the Iowa workforce. It is estimated that about 138,000 Iowans have had a heart attack or CHD, 6% of Iowan adult population. (BRFSS, 2010)
- Iowa has a 30% reduction in the CHD death rate since 2000, from 187.1/100,000 in 2000 to 131.6/100,000 in 2009 and has met the national Healthy People 2010 objective of reducing the CHD death rate to 162/100,000 since 2004.

Fig. 1 CHD Age-Adjusted Death Rates Iowa Males vs. the US Males



Since 1999, Iowa's male CHD death rate was higher than the national male's average. In 2007, Iowa's male CHD death rate was higher than the national average by 17 deaths/100,000 (182.1/100,000 vs. 165.4/100,000).

Fig. 2 CHD Death Rate by Specific Age Group, Iowa



Despite the overall decrease in CHD in Iowa, age-specific death rates for males aged 35-44 (data not shown here) showed a 2% increase on average, and both male and females aged 45-54 had a 1% increase annually in the past ten years.

Source: The years before 2008 are from http://wonder.cdc.gov/cmf-icd10.htm, icd10 I20-I25. The 2008 and 2009 data is from Vital Records, Iowa Department of Public Health.

Gender and Race/Ethnicity Disparities

Males showed significantly higher premature CHD death rates than females. Males younger than age 65 had 3 times the rate for females in the same age group.

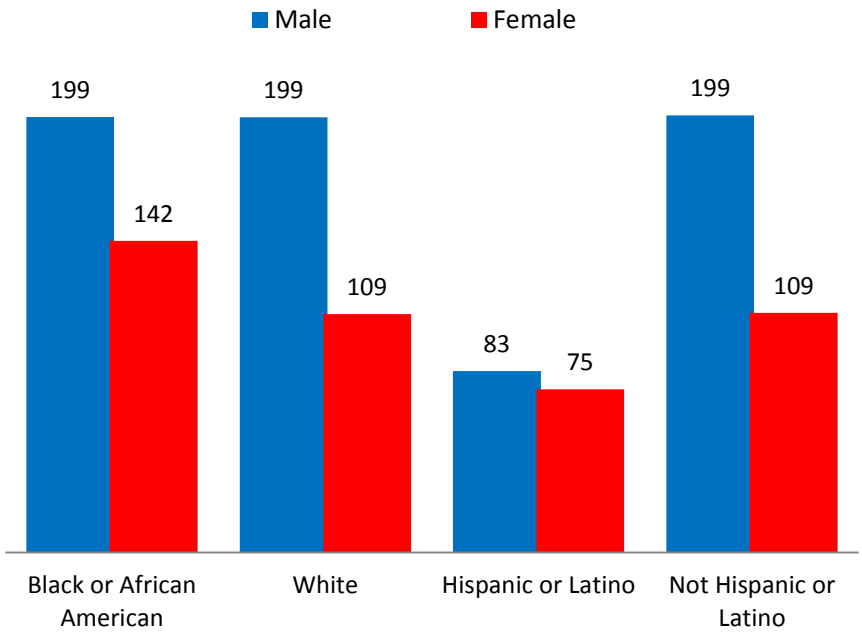
Table 1. CHD Death Rate by Age Group and Gender, Iowa 2009

	Male		Female		Ratio
Age group	Num	Rate per 100,000	Num	Rate Per 100,00	between M/F
<45	57	26.3	15	6.6	4.0
45-54	214	97.4	61	27.7	3.5
55-64	388	220.3	125	70.0	3.1
65-74	502	494.4	215	186.3	2.7
75-84	761	1,222.7	600	674.5	1.8
85+	823	3,616.9	1,400	2,622.0	1.4
Total	2,745	180.8	2,416	94.4	1.9

Black and White males showed about the same CHD death rates (2003-2007 combined); however black females exceeded white females by33 deaths/100,000: 142.2/100,000 vs. 108.8/100,000 during the same period.

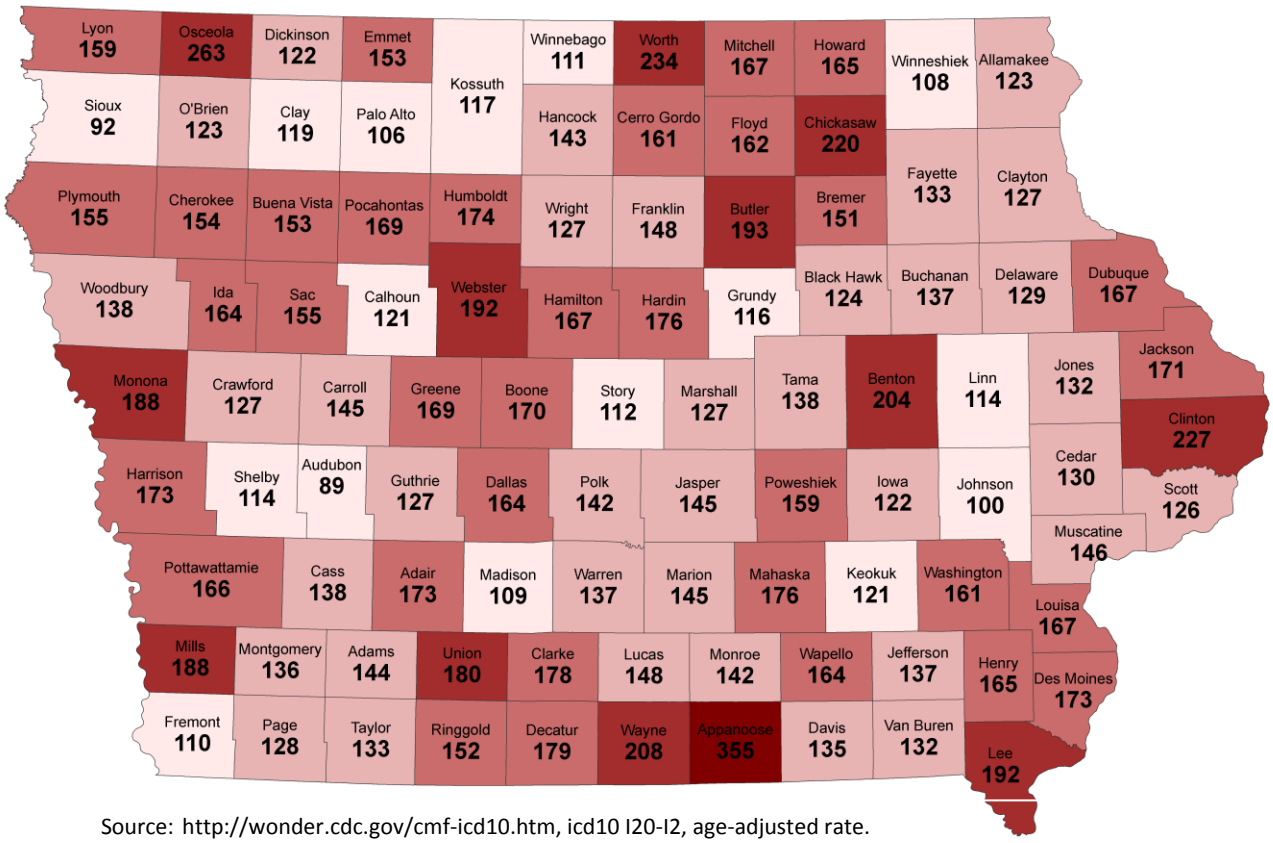
Non-Hispanic males and females had higher CHD deaths than their Hispanic counterparts.

Fig. 3 CHD Age-Adjusted Death Rate by Race, Hispanic Origin and Gender, Iowa 2003-2007



Mortality by Geographic Variation

Fig. 4 CHD Age-Adjusted Death Rate by County, 2003-2007



Source: http://wonder.cdc.gov/cmf-icd10.htm, icd10 I20-I2, age-adjusted rate.

- In 2003-2007 combined, CHD death rates ranged from 89 deaths/100,000 in Audubon County to 355 deaths/100,000 in Appanoose County.
- Nine counties had an increased CHD death rate compared to the rates during 1999-2002 average. They were Appanoose, Worth, Butler, Chickasaw, Howard, Carroll, Lee, Washington and Emmet.
- One county's rate did not change (Guthrie) and 80 counties had a decreased rate compared to the rates of 1999-2002 combined.

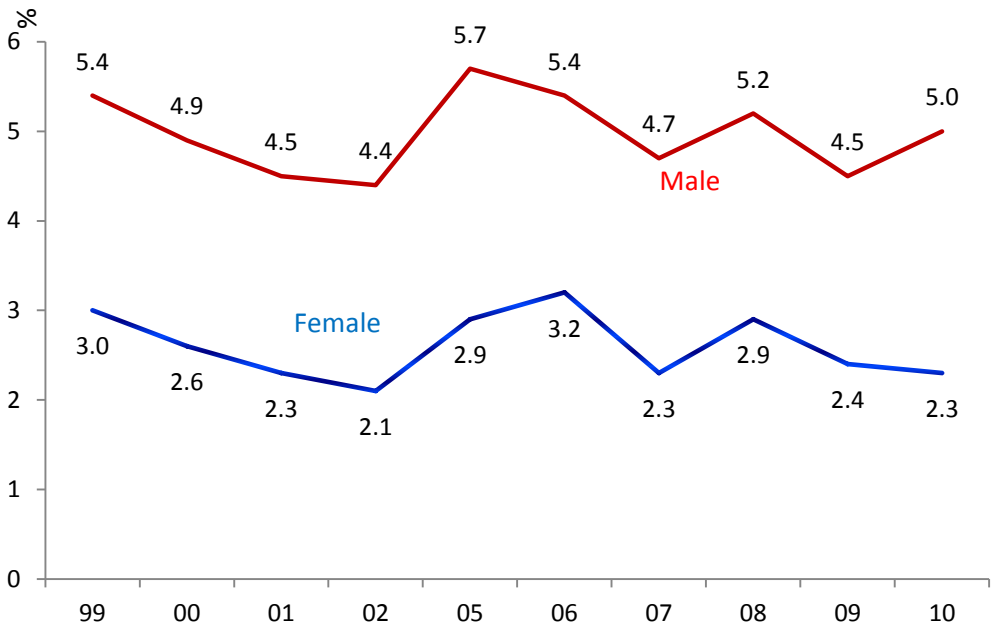
CHD Prevalence

The prevalence data for heart diseases is collected through the Behavioral Risk factor Surveillance System (BRFSS). About 6% of Iowans reported that they were told they either had a heart attack or coronary heart disease. The percentage represented about 138,000 Iowans (2010).

In the past decade, both Iowa males and females did not show significant changes in CHD prevalence.

Similar to the mortality rate, Iowa males (5%, 2010) had two times CHD prevalence rate of Iowa female's (2.3%, 2010).

Fig. 5 Prevalence of CHD among Iowa Adults, 1999-2010



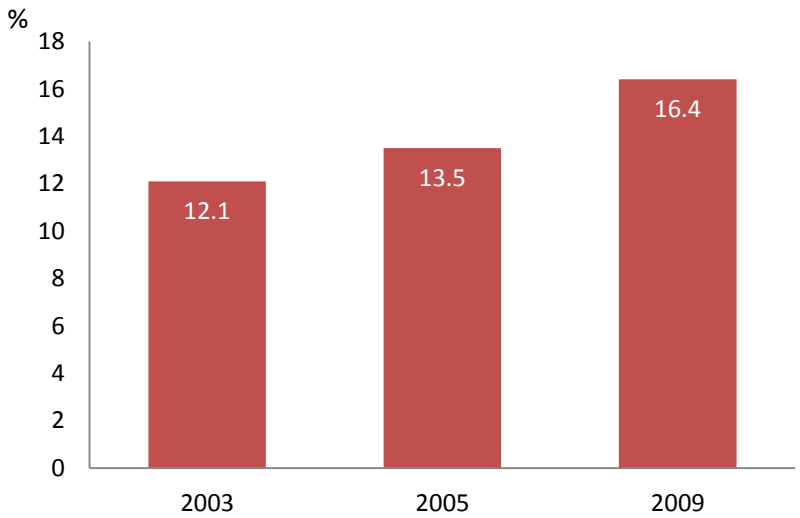
Sources: The years before 2008 are from http://www.cdc.gov/dhdsp/. The years of 2008-2010 are from Iowa BRFSS, Iowa Department of Public Health. All rates are age-adjusted based on self-report: 'have you even been told by a doctor or other health professional that you had coronary heart disease? In 2003 and 2004, Iowa did not include this question in the BRFSS survey.

Of heart attack symptoms (2009):

- 62% Iowans knew that pain or discomfort in the jaw, neck, or back was a symptom;
- 66.7% thought that feeling faint, light-headed, or weak was a symptom; 95% knew that chest pain or discomfort was a symptom;
- Only 41.2% knew that sudden trouble seeing in one or both eyes was not a symptom;
- 89% knew that pain or discomfort in the arm or shoulder was a symptom; and
- 87.9% knew that shortness of breath was a symptom of a heart attack.
- Only 16% correctly knew all six symptoms of a heart attack.

http://www.idph.state.ia.us/brfss/common/pdf/2009BRFSSannual.pdf. The rates in the six questions of symptom are crude rate.

Fig. 6 Prevalence of Recognition of Signs and Symptoms of Heart Attack



Sources: The year 2003 and 2005 are from http://www.cdc.gov/dhdsp/. The year 2009 is from Iowa BRFSS, Iowa Department of Public Health. Rates are age-adjusted based on correct responses to all of the six questions on the left. The questions were included only the three years as indicated above in Iowa BRFSS survey.

CHD Hospitalization

- 14% of hospitalizations resulted from major cardiovascular diseases (2009), including heart disease and stroke, about one out of every seven hospital stays.
- In 2009, Iowa reported over 13,000 coronary heart disease (CHD) hospital stays, which was the most common cardiovascular disease causing hospitalizations (27% of the total, see Fig. 6).
- Of hospital stays due to CHD, acute myocardial infarction* (AMI or heart attack, 6,058) and coronary atherosclerosis (7,291) accounted for 12% and 15% of all major cardiovascular disease, respectively.
    - Among AMI hospital stays
        - 62% were males; of them, 47% were under age 65 vs. 28% for women
        - 64% of them came from the emergency department
    - Among coronary atherosclerosis hospital stays
        - 64% were males; of them , 44% of males were under age 65 vs. 33% for women
        - 44% of them were admitted by physician's order
- Like mortality data, CHD hospital stays showed a steadily declining trend in Iowa, with an average 6% decrease per year from 2000-2009.

Note: *AMI: ICD-9-CM 410; Coronary Atherosclerosis and other coronary heart disease: ICD-9-CM 411-414, 429.2

Fig. 7 Hospital Stays by Major Cardiovascular Diseases, Iowa 2009

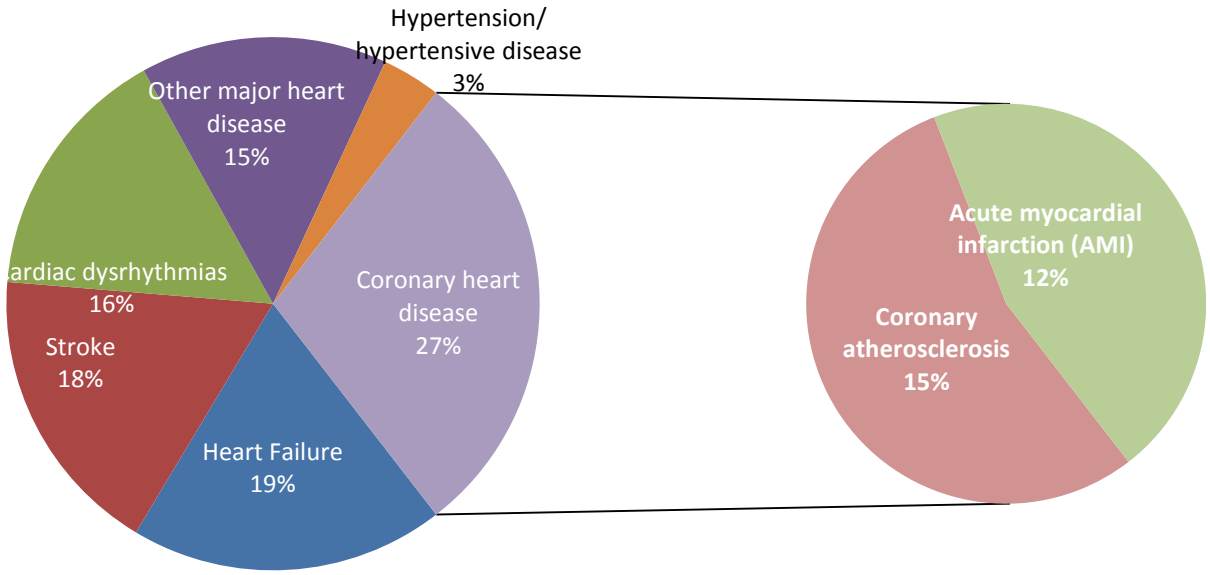


Table 2. Hospital Stays MI by Discharge Status, 2009

Age Group	Number	Home (%)	LTC (%)	Died In-Hospital (%)
Male				
<35	40	92.5	5	
35-44	180	90.6	0.6	1.1
45-54	646	89.9	0.5	1.6
55-64	885	87.0	1.1	2.8
65-74	835	81.0	5.4	4.0
75-84	727	67.8	14.4	7.3
>84	422	47.2	33.4	12.3
Sub Total	**3735**	**78.2**	**8.2**	**4.7**
Female				
<35	11	90.9		
35-44	66	89.4		
45-54	213	91.1	0.5	3.3
55-64	363	82.4	5.2	2.2
65-74	444	73.0	11.0	5.9
75-84	610	59.2	24.1	6.7
>84	616	42.7	38.0	12.8
Sub Total	**2323**	**65.0**	**19.4**	**6.9**
Total	**6058**	**73.1**	**12.5**	**5.5**

Outcomes of AMI Hospital Stays

- **The proportion of in-hospital deaths for AMI and coronary atherosclerosis was 5.5% and 0.8% (data not shown here), respectively. Females had a higher AMI death rate (7%) than the males (5%).**
- **The proportion of females who were discharged to long-term care (LTC, 19%) was 2 times higher than the one for males (8%).**
- **90% of patients aged 54 or younger were discharged to home. 18% of patients aged 55 or older were discharged to LTC.**

Table 3. Number and Hospitalization Costs due to Coronary Heart Diseases, Iowa

	2007		2008		% Chg from 2007	
	Number of discharges	Total Hospital costs	Number of discharges	Total Hospital costs	Number of Discharge	Hospital Costs
AMI	6,577	$ 98,101,298	6,711	$ 109,951,482	2%	12%
Coronary Atherosclerosis	10,597	$ 146,612,031	9,972	$ 150,868,274	-6%	3%
Total	17,174	$ 244,713,329	16,683	$ 260,819,756	-3%	7%

Source: HCUP State Inpatient Databases, Agency for Healthcare Research and Quality (AHRQ), based on data collected by the Iowa Hospital Association. Total hospital charges were converted to costs using cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS). 2008 costs data is the latest year available.

- While the hospitalizations due to coronary heart disease were decreasing, the total hospitalization costs for CHD increased from $244.7 million in 2007 to $260.8 million in 2008 (7% increase).

- Of the total costs, Medicare was the largest payer source:

  - Total Medicare payments were $176.6 million (63%);
  - Total Medicaid paid $13 million (5%);
  - Private insurance paid $75 million (29%) and
  - Uninsured and others paid $8.8 million (3%)

Making Use of this Information

Prevention and Control Strategies

The Iowa Department of Public Health (IDPH) received funding for the Heart Disease and Stroke Prevention (HDSP) program for four years beginning in 2009 from the CDC.

The funding requires funded states to address the "ABCS" of heart disease and stroke prevention, and policy, system and environmental change that will decrease risk factors with a focus on preventing and controlling high blood pressure through reducing sodium intake. Following CDC's guidelines and priorities, the Iowa HDSP program, works with its partners, to meet six goals in a state plan:

1. Control and raise awareness of high blood pressure;
2. Control and raise awareness of high blood cholesterol;
3. Improve emergency response;
4. Improve healthcare quality;
5. Increase awareness of signs and symptoms of heart attack and stroke and the need to call 911; and
6. Eliminate Disparities

Healthy People 2020 Goal:

Reduce coronary heart disease deaths to 100.8/100,000

In 2009, the Iowa CHD death rate was higher than the new national Healthy People 2020 objective by 31 deaths/100,000 (131.6/100,000 vs. 100.8/100,000). If Iowa could reduce CHD by 3 deaths/100,000 in each of the next ten years, we will be able to reach the goal.

What are the implications of these findings?

The gap between the mortality rate for Iowa males and national males is becoming larger, which means Iowa males have a slower decline in the overall CHD rate than the trend of national males. Currently, IDPH receives funding that targets older women for heart disease and stroke screening and risk reduction. There is a need in Iowa to implement evidence-based prevention awareness, screening and risk factor reduction targeted at younger men.

Who, besides IDPH, works on heart disease prevention and control here in Iowa?

- **Iowa Healthcare Collaborative**
- **American Heart/Stroke Association**
- **University of Iowa, College of Public Health**
- **University of Iowa, College of Dentistry**
- **Iowa Cardiovascular and Stroke Task Force**

References:

1. 2009 Vital Statistics of Iowa: http://www.idph.state.ia.us/apl/common/pdf/health_statistics/2009/vital_stats_2009.pdf/
2. CDC WONDER at http://wonder.cdc.gov/
3. Division for Heart Disease and Stroke Prevention: Data Trends and Maps at CDC website: http://apps.nccd.cdc.gov/NCVDSS_DTM/Default.aspx
4. Health in Iowa Annual Report from the 2009 BRFSS: http://www.idph.state.ia.us/brfss/common/pdf/2009BRFSSannual.pdf/
5. State Statistics on All Stays at http://hcupnet.ahrq.gov/HCUPnet.jsp/